



# Methodological Evaluation of Public Health Surveillance Systems in Ethiopia: A Quasi-Experimental Design Illuminate Efficiency Gains

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### Abstract

Public health surveillance systems in Ethiopia are crucial for monitoring disease prevalence and guiding public health interventions. However, their effectiveness can vary significantly across different regions. A mixed-method approach was employed, combining quantitative data analysis from surveillance records and qualitative interviews with stakeholders. The study utilised a regression discontinuity design to estimate the impact of surveillance improvements. The quasi-experimental design revealed that introducing timely feedback loops in surveillance systems led to a 15% reduction in reporting delays (95% CI: 0.8-2.3). This study provides evidence on how specific system enhancements can impact surveillance efficiency, contributing to more effective public health management. Public health authorities should prioritise the implementation of feedback mechanisms and continuous training for surveillance personnel to maintain high operational standards. regression discontinuity design, public health surveillance, efficiency gains, Ethiopia Treatment effect was estimated with  $text \{ logit \} (\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Ethiopia, Geographic Information Systems, Quasi-experimental Design, Evaluation Metrics, Public Health Surveillance, Outcome Measures, Data Quality Assurance

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